

A rare case: spinal subdural and spinal subarachnoid hemorrhage due to anticoagulant use

Spinal subdural and spinal subarachnoid hemorrhage due to anticoagulant use

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Abstract

Spinal Subdural Hematoma (SSDH) and Spinal Subarachnoid Hematoma (SSAH) are the spinal hematoma types that can cause spinal cord and nerve compression. The risk of formation of atraumatic spinal hematoma due to warfarin use is rare. Specifically, the association between SSDH and SSAH is even more rare. Here we present a patient with a history of warfarin use who had paraplegia followed by analgesic complaints of irregular low back pain in our case. We have tried to emphasize that emergency care physicians should be careful about spontaneous spinal hematomas that may require emergency intervention in the presence of predisposing factors, even in the case of a simple back pain complaint.

Keywords

Anticoagulants; Spinal; Subarachnoid Hemorrhage

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Introduction

Warfarin is an anticoagulant commonly used to prevent systemic embolism. Although the increased risk of intracerebral hematoma in patients receiving anticoagulant therapy is a well-known phenomenon, spinal hematoma is rarely reported in the literature [1]. Patients with warfarin-associated intraspinal hematoma may also develop atypical symptoms, depending on the slow development of the bleeding so diagnosis is delayed [1]. Acute SSDH is a rare and potentially life-threatening disease. Spontaneous hemorrhage should be considered in patients receiving anticoagulant treatment, or in patients with bleeding disorders who have evidence of compression on the spinal cord or cauda equina. SSAH is a rare lesion that is difficult to diagnose and has destructive results. It occurs in 0.05-1.5% of all SSAH cases in the literature [2,3]. Patients with intraspinal hematoma are admitted to the Emergency Department with variable symptoms. Early diagnosis of spinal hemorrhage is important for the urgent treatment of patients and maintenance of normal function. Prognosis depends on the severity of the neurological sequelae. Delaying in diagnosis and treatment easily causes irreversible and serious neurological sequelae.

Case Report

A patient with back pain was admitted to the emergency room and her pain started 3 days ago and did not relieve with analgesic medication. The pain of the patient was like a rupture spreading from both sides of the waist toward the two feet, did not change with the position, sometimes regressed and sometimes exacerbated. It was learned that the patient's pain continued for three days despite oral or IM analgesic and had recurrent applications for different emergency services. When the anamnesis is detailed, it was learned that the patient's pain started after the patient had done housework by carrying heavy objects three days ago and there was no trauma story. The patient had surgery for the femur ten years ago and she has been using warfarin since mitral valve replacement operation. The neurological and other system examination was completely normal at the first examination of the patient. No motor-sensory deficits were detected in the extremities. When the vital findings were evaluated, pulse rate was 93 beats/min, Blood Pressure: 135/84mmHg. The patient had pain in a rupture-style manner, starting from the thoracolumbar region and increasing in severity, extending to the feet. Mechanical back pain was considered as a preliminary diagnosis. The patient was treated with intramuscular non-steroidal analgesic and intravenous tramadol. The patient's pain decreased after analgesic administration. In laboratory tests, the INR value was 7.61 (0.8-1.2), while the other laboratory values were within normal limits. Warfarin treatment was stopped and IV K vitamin was administered. The pain of the patient was re-exacerbated. Thoracolumbar angio CT was arranged for differential diagnosis to detect the pain from the aortic dissection and lumbar pathologies. No dislocation or lumbar fracture was detected. Fluid localization at T9-L2 level was observed. The physical examination of the patient was repeated when her pain increased suddenly and violently. Acute urinary incontinence occurred, paraplegia developed

with loss of sensation in both lower extremities. On this basis, thoracolumbar MRI was requested considering the preliminary diagnosis of haemorrhage in patient's spine. MRI detected hemorrhagic material in the thoracolumbar spinal canal locally between T8-9 and L1-3 distances. In addition, central spinal cord dilatation (syringomyelia) appeared in some parts of the spinal cord. There was no evidence of contrast enhancement to suggest a neoplastic lesion in the postcontrast study, and there was no evidence to support vascular malformation within the examination limits (Figure 1-2). Subarachnoid and subdural hemorrhages were considered in the thoracolumbar spinal canal due to the use of anticoagulant in the patient. The patient was hospitalized in the brain surgery clinic. Twenty-four hours after the emergency department visit, the patient's INR value was corrected and she was taken to the operating room. During the operation, subdural hemorrhage drainage and T9-L2 total laminectomy were performed. No abnormal vascular or mass findings were observed.

Discussion

Spontaneous spinal hematomas were first described more than 60 years ago by Schiller et al. [4]. SSAH is defined as a blood pack with a solid arachnoid membrane which can cause compression and neuropathy in the spinal cord in the subarachnoid space [5]. Intracranial abnormalities occur in the majority of SSHD patients [3]. Less than 1% of patients have a subarachnoid hemorrhage, which includes arteriovenous malformation of the spinal artery or saccular aneurysm of the spinal cord. Sometimes primary spinal cord tumors (eg, ependymoma, hemangioblastoma), nerve plexus tumors or metastases cause subarachnoid hemorrhage. Spinal trauma, coagulopathies, and autoimmune vascular disorders are additional sources of bleeding in the subarachnoid space [6]. SSDH's are less common than intracranial subdural hematomas and spinal epidural hematomas.

The causes of SSDH's can be divided into three groups including (a) posttraumatic, (b) iatrogenic (following surgical lumbar puncture), and (c) spontaneous underlying malformations (eg vascular malformation neoplasm) and coagulation failure. One theory is that the hemorrhage originates within the more vascular subarachnoid space, possibly after sudden raised intra-abdominal or intrathoracic pressure [7,8]. If the cerebrospinal fluid (CSF) can not neutralize this force, the spinal cord will pull the veins and cause subarachnoid hemorrhage [8]. Depending on the physical activity, the sudden increase in pressure can break the extra small arachnoid vessels on the inner surface of the dura and the blood can pass through the thin and sensitive arachnoid membrane [9,10]. Conversely, the root of the bleeding may be the subdural space that can pass through the arachnoid membrane and cause subarachnoid hemorrhage. In this case, it may be impossible to determine whether the source of the blood is in the subarachnoid or subdural region. Daily physical activity may induce bleeding in anticoagulated drug users, as in our case [11]. A typical clinical picture is severe back pain with sudden onset with or without radiculopathy. In many cases in the literature, patients complain of frequently back pain (93%), paraplegia/paracentesis (84%) and bladder dysfunction (45%) and variable clinical presentation and prognosis according to



Figure 1. The appearance of the hematoma in the vertebral spinal canal (white arrow) on the transverse plane in spinal MR



Figure 2. View of the hematoma (white arrow) in the spinal canal on the sagittal plane in spinal MR

the location of the spinal canal [12, 13]. In our case, the patient was admitted to the emergency room with complaints of back pain only, neurological examination was completely normal, and paraplegia and urinary retention were developed at follow-up. In studies conducted by Domeniucci et al., SSAH patients reported that 14% of the bleeds were thoracic, 26% of the thoracolumbar, and 14% of the bleeding were observed in the lumbar region [6]. In Margin et al.'s study of patients with SSDH, they showed a 40% bleeding rate in the thoracic spinal segment and a 23% bleeding rate in the thoracolumbar region [12]. In our case, the hemorrhagic region was in the thoracolumbar region and was compatible with the literature.

Spinal angiography is generally considered to be the gold standard for imaging of spinal arterial aneurysms, arteriovenous malformations, or other pathologies that can cause spinal subarachnoid hemorrhage [13,14]. MR imaging is very effective in defining the degree of spinal hemorrhage and in determining the relationship between bleeding and thecal sac [3]. MRI is the first imaging method to follow up the treatment, showing chronological changes of hemorrhage. Although MR imaging is the most effective method for diagnosing hemorrhage in the spinal canal, it is difficult to distinguish subdural and subarachnoid hemorrhage with MRI. In two cases reported by Komiyama et al., comorbid SSDH and SSAH, which can not be completely separated in MR imaging, have been reported [15]. The exact location of the hematoma is determined by surgical exploration [6,9].

Spontaneous resolution has been shown in many cases with SSAH [14]. But at the same time in our case, the subdural hematoma was also accompanied, and neurological symptoms appeared. Patients with SSAH and SSDH reported the worst outcome in the review by Domeniucci et al. who evaluated SSDH patients [6]. Emergency surgery is needed as a primary treatment for such patients.

Conclusion

It should be kept in mind that SSAH concomitant SSDH is very rare, especially in patients taking anticoagulant therapy and have high INR. In addition, spinal hematomas are preliminary diagnoses that should be kept in mind in patients who come to the emergency service with complaints of back pain. Even before the development of paraplegia, early diagnosis is possible by a proper anamnesis and correct questioning of the drugs used. The first diagnosis should be intraspinal hematoma in patients who are admitted to the hospital with acute cord or caudal compression findings and using anticoagulants.

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Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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